



Revision 1
May 16, 2001

5.0 DATA MANAGEMENT PLAN

This Data Management Plan (DMP) describes the data management practices to be implemented during the performance of the VBI70 Site Phase III Sampling Program. This DMP defines data flow paths, identifies and assigns organizational and individual responsibilities, and describes the procedures and protocols by which the data management processes function.

5.1 DMP Objectives

This DMP is designed to ensure that VBI70 Site data are collected in a consistent manner and transferred to a central repository in an orderly and timely manner. This DMP provides the structure required to incorporate and disseminate data collected during the Phase III Field Investigation.

In summary, the objectives of the DMP are to:

- Identify and assign organizational and individual responsibilities;
- Describe the flow of information through the data management process;
- Describe the checks and controls necessary to insure data accuracy and validity;
- Identify and address key data elements and process dependencies; and
- Provide an organized and controlled system for the handling of data that will allow future users to make informed decisions regarding the comparability of historical data sets.

5.2 Organizational Relationships

Key project personnel and organizational relationships are described in Section 1.0.

5.3 Organizational Responsibilities for the Database

| The Project Data Manager (Washington Group) is ultimately responsible for the overall data management process of the project database. This process includes the development, implementation, and maintenance of procedures and protocols to ensure that the data are properly documented, stored, retrieved, analyzed, and archived.

| Washington Group is responsible for maintaining project files of all data generated during the Phase III field investigation until these files are transferred to the final repository at USEPA.

| Washington Group and subcontracted analytical laboratories are responsible for collecting data according to project requirements; reviewing data for accuracy, completeness, and technical adequacy under approved quality control procedures; completing, reviewing, and signing appropriate data processing forms; and transferring original data and data forms to the USEPA RPM for cataloging and storage. It is the responsibility of the Washington Group Site Manager to forward copies of all field and laboratory generated data to the RPM in a timely manner.

| Validated electronic updates of the database must be submitted by Washington Group on a biweekly basis at a minimum.

5.4 Data Management Team Responsibilities

The key personnel and primary responsibilities of the Data Management Team (DMT) are summarized below. Some of the functional responsibilities described can be held by a single person or delegated to other individuals as appropriate. However, it is the responsibility of the person identified to ensure that tasks are completed.

| Data Services Manager (Washington Group) – Develops and revises standard operating procedures and protocols for the DMT to achieve data management guidelines. These procedures and protocols are subject to the approval of the USEPA Technical Contact for Data Management/GIS.

| Project Database Manager (Washington Group) – The Project Database Manager is responsible for overseeing the development, implementation, and maintenance of the computerized database used to electronically store and process project data. The Database Manager is also responsible for the identification and acquisition of hardware and software necessary for the efficient, effective storage, retrieval, and manipulation of computer-based data files. The Database Manager works with project management and technical personnel during initial project planning to identify those key data parameters to be included in the computerized project database and estimates the scope of required data programming, entry, database error-checking, and electronic file maintenance services.

| Data Server Manager (USEPA) – The Data Server Manager maintains the physical location of the electronic database and performs periodic backups. The Data Server Manager manages the database server application in regards to software updates and troubleshooting. The Data Server Manager is also responsible for database security and user authorization.

| Field Activities Database Manager (Washington Group) – The Field Activities Database Manager is responsible for overseeing the accurate and complete population and maintenance of the computerized database used to electronically store and process data obtained during field collection activities. The Field Activities Database Manager is responsible for verification of electronic data entry and maintenance of hard copy forms and logbooks. The Field Activities Database Manager is also responsible for electronic database and document security.

| Project Records Manager (USEPA) – The Project Records Manager is responsible for coordinating the receipt, cataloging and filing of all hard copy documents and electronic data deliverables. Upon receipt of a document, the Project Records Manager assigns it a Document Control Number (DCN) and enters this number in the Superfund Document Management System (SDMS). Electronic data are routed to the Project Database Manager for electronic data entry

and processing. Hard copy data documents are stored in appropriate project files.

| **Field Activities Records Manager (Washington Group)** – The Field Activities Records Manager is responsible for coordinating the receipt, cataloging and filing of all hard copy documents and electronic data deliverables. Upon receipt of a document, the Field Activities Records Manager assigns it a Washington Group Document Control Number (DCN). The Field Activities Records Manager reviews the document for legibility and completeness. Illegible or incomplete documents are returned to their source for correction/amendment and re-submittal. Hard copy data are forwarded to the Data Entry Clerk for manual data entry and independent data entry verification. Additionally, the Field Activities Records Manager is responsible for coordinating analytical laboratory services, communicating data deliverable requirements, receiving and routing completed laboratory data packages to qualified chemical data validation/verification personnel and ultimately submitting the validated/verified data to the Field Activities Database Manager for incorporation into the database.

| **Systems Programmer/Analyst (Washington Group)** – Systems Programmers/Analysts are responsible for assisting the Project Database Manager with developing, implementing, and maintaining computerized databases used to store project data.

| **Data Entry Clerk (Washington Group)** – Data Entry Clerks are responsible for the manual entry of selected project data into the electronic database under the direct supervision of the USEPA Work Assignment Manager (WAM). Data Entry Clerks also perform independent error-checks on the data files and make corrections as needed.

5.5 Forms of Data

A variety of data forms are anticipated to be collected during the Phase III Field Activities. These include, but are not limited to:

- Field Data Sheets
- Field observations and measurements
- Maps
- Photographs
- Laboratory analysis results and quality control data
- Information on Requesting and Receiving Property Access

Access Agreements - These data include the property street address and house number, the name and signature of the property owner, the signature date, the owner's phone number and any comments provided by the property owner at the time of access authorization.

| **Field Data Sheets** - These data include identification of sampling locations, the spatial layout and design of existing buildings and structures, sample collection and preparation measurements, and

sample identification numbers. The procedures by which these forms are completed are summarized in the FSP (Section 3.0).

Field Observations - These data include descriptions of weather conditions encountered during sampling, names of the sampling crew, deviations from the FSP or SOP, and any anomalies observed while collecting the sample (e.g., visible staining, strong odor, etc.). The procedures by which these observation are made are summarized in the FSP (Section 3.0).

Maps - Maps may be developed in the field during sample collection efforts (field diagrams) or may be prepared after sampling is complete using GIS tools.

Photographs - Photographs may be taken during implementation of field activities when visual records of the activities are required. Additionally, aerial photographs of the site may be used as a GIS tool for development of a base map of the site.

Laboratory Analyses - The results of physical and chemical laboratory analyses of field samples are another form of data that will be incorporated into the database. Typically, these data are acquired from laboratories in hard copy and/or electronic format.

Differing levels of reliability may be placed on data with respect to their accuracy and precision. Within the context of data management, two distinct types of data will be stored in the Project Database: primary and secondary.

5.5.1 Primary Data

Primary data derive principally from two sources: on-site field observations and laboratory analyses of physical samples taken as a part of on-site investigations. Because these data are collected and tested using procedures and protocols outlined in the Project Plan, they are of quantifiable accuracy and precision. Examples of primary data include field data sheets, field observations, field maps (site diagrams) and analytical laboratory data packages.

5.5.2 Secondary Data

Secondary data include all data generated by private and public entities outside of the scope of the Project Plan. These data typically include such documents as:

- Site-specific and regional vicinity maps
- Historical land use and property ownership records
- Regional geologic, and hydrologic survey data collected by outside firms and public agencies
- Site-specific physical and chemical data generated by outside firms and agencies not directly involved in this study

- Published accounts of investigations undertaken at other sites that may assist in the analysis and interpretation of site-specific primary data collected

If not carefully documented, secondary data can be of variable and indeterminate accuracy and precision. Whenever data obtained from secondary sources are of uncertain merit, they must be used with caution in any decision-making process.

5.6 Data Flow

A conceptual diagram of data flow for the Phase III sampling is presented in Figure 3-1 of the FSP (Section 3.0). The following sections describe the sources of information and the processes identified for the collection, transfer and organization of primary and secondary data sources.

5.6.1 Reference Data Sources

Two principle sources of secondary data are utilized in the collection and management of information for the Phase III investigation, the 1998 City and County of Denver Tax Assessment data and the historical VBI70 Phase I and Phase II site investigation data. These data are used for the purpose of generating key derivative reference tables (Access Agreement Database). As stated in the FSP (Section 3.0), the Access Agreement Database are updated as new data are received during implementation of the Phase III investigation.

1998 City and County of Denver Tax Assessor Data - The initial source of data for property and ownership information is the 1998 City and County of Denver Tax Assessor data purchased from Property Data Center, Inc. (PDC). These data consist of approximately 11,000 property and ownership records bounded to the North by East 52nd Avenue, to the South by East 26th Avenue, to the East by Colorado Boulevard, and to the West by Inca Street. Some of the data points included are: property addresses, coordinates, land use classifications, living area square footage, and ownership information.

| Historical Phase I and Phase II Sampling Data – The historical sampling results are not stored in
| the project database; however, the list of properties and access information are utilized to identify
| approximately 1500 properties were sampled for metals in 1998 by Superfund Technical
| Assessment and Response Team (START) and Response Engineering and Analytical Contract
| (REAC) personnel. This information is used to identify target properties for different phases of
| the program.

The reference tables and data points derived from the reference data are summarized below.

Reference Table	Data Points
List of Prospective Properties	Property address Geographic coordinates Land use classifications Total living area
Ownership Information	Owner name Owner address
Access Agreements	Date of mailing Authorization status Contact information and language preference

The list of all prospective properties is processed, using study area boundary and historical sampling information, to form a list of target properties. Letters requesting from USEPA requesting authorization for access are then generated for owners of target properties and tracked as described in Section 3.0.

5.6.2 Data Acquisition

This section summarizes the collection, transfer and organization of primary field observations and laboratory analyses with regard to the data management process. Details regarding specific data collection procedures can be found in the FSP (Section 3.0).

5.6.2.1 Field Sampling

Prior to field sampling, a list of properties approved for sampling is generated by the Site Manager. Each sampling team is then given blank copies of media specific data collection forms and a set of pre-printed sample identification numbers printed on self-adhesive labels. The data form is filled out at the time of sample collection by the sample collection team according to procedures detailed in the FSP (Section 3.0).

Upon completion of daily sampling activities, the sampling team returns to the field office location with samples and corresponding data sheets. The FPL maintains a log of sample identification numbers that have been used, noting any missing or destroyed labels. Data sheets are forwarded to the FPL for review. Verified forms are then forwarded for entry into the Field Activities Database for data entry. Refer to the Data Entry SOP No. ISSI-VBI70-05 for more details.

5.6.2.2 Laboratory Data Entry

During sample analysis at the laboratory, analytical results are either entered into the laboratory information management system or directly downloaded from the analytical instrument. The data are reviewed in the laboratory for errors or omissions to assure that the data are reported in the correct format. Upon completion of these efforts, the laboratory submits the data electronically accompanied by the hardcopy raw data to the appropriate Field Activities Records Manager (Washington Group). All data transfer activities follow only after appropriate data screening, verification and validation procedures. Refer to the Electronic Data Upload SOP No. WGI-VBI70-01 for more details.

5.7 Database Organization

A database consists of conceptual and physical design components. The conceptual design integrates the intended function, contents, and products of the project database; the procedures for data entry and electronic data incorporation; the needs of data users; and compatibility requirements (within database software limitations). The physical design implements the conceptual design through programming, data incorporation, and built-in software functions.

In addition to meeting the needs of data users, the database management system will incorporate the following capabilities:

- Store tabular data (such as analytical results, qualifier codes, sample locations) in a relational database management system.
- Allow the user to query multidisciplinary data.
- Provide an audit trail for sample tracking, including a QA program to minimize erroneous data entry.
- Allow integration of new data.
- Document the database structure, code definitions, and means of accessing information.

A client-server database system is utilized for the management of Phase III data. The project database is stored and maintained on a Microsoft SQL Server database system (server) located in the USEPA Denver office. Wide area network access to the project database is provided via TCP/IP communications (Internet). Data entry and reporting are performed using a custom MS Access interface (client) originally developed by ISSI, modified by Washington Group, and tailored specifically for the Phase III Field Investigation. The Access tables store the data in a structure consisting of rows and columns. Relationships define how data in one table relate to data in another table. Queries store the framework for selecting subsets of data from tables. The database is constructed of data tables and reference, or "look-up" tables. A detailed description of the Project Database structure (Entity Relationship Diagram and Data Dictionary) is presented in Appendix H.

The following outlines present a generalized structure of the data tables and field attributes for the project database.

For Properties Approved for Sampling:

Property Location Information

- House Number
- Street Name
- Neighborhood

Property Surface Soil Sample Information

- Building Type (Residential, School, Park, Alleyway)
- Depth of Sample
- Sample Type (Composite, Grab)

Property Indoor Dust Sample Information

- Number of Templates Collected
- Number of Templates Taken

All Media

- Chain-of-Custody Information
- Analytical Results
- Analysis and Sample Preparation Methods
- Laboratory and Validation Qualifiers

Access Agreement Tables

Owner Information Table

- Owner Contact Information
- Owner Language Preference

Access Agreement Letter Table

- Target Property Address
- Date Letter was Sent
- Status of Access Authorization (approved or denied)

5.8 Data Screening, Verification, and Validation

All documents received and catalogued by the DMT are subject to review. Two separate and distinct levels of document review are performed:

- Data Verification
- Data Validation

The following paragraphs describe the performance of these two levels of data review.

5.8.1 Data Verification

The term 'verification' refers to a review process in which data are checked for accuracy and completeness. The Project Database Manager and Field Activities Database Manager are responsible for overseeing this effort. Data verification will be performed on all original data (e.g., sample data collection sheets) to ensure that all information is correct. Any hardcopy or electronic data requiring modification as a result of the verification effort are returned to the source for amendment or correction. After the correction or amendment is complete, the data are then returned to the Project Database Manager or Field Activities Database Manager (as appropriate) and are re-verified to ensure that the appropriate corrections and/or amendments were performed correctly.

5.8.2 Data Validation

Data validation, as it pertains to database management, refers to a point-by-point comparison of the database with the primary data source (e.g., data collection sheets, COC forms, etc.). Database validation will be performed on all data transfers, however, the extent of that validation effort is dependent on how the data were compiled into the database.

Manual Data Entry

One hundred percent of all data entered onto a database table will be verified for accuracy. If corrections or amendments are required as a result of the review, this will be performed in accord with the details outlined in Section 5.9. After the correction or amendment is complete, the data are returned and points where corrections were requested are re-validated to ensure that the appropriate corrections and/or amendments were performed correctly.

Electronic Data Transfer

Twenty percent of all data that are transferred in electronic form will be verified for accuracy against the original hardcopy data. If corrections or amendments are required as a result of the review, this will be performed in accord with the details outlined in Section 5.8.3. After the

correction or amendment is complete, the data are returned and points where corrections were requested are re-validated to ensure that the appropriate corrections and/or amendments were performed correctly. When errors in the data are observed, further verification of the electronic data is necessary. One hundred percent of the electronic data transfers that require correction will be verified for accuracy. If corrections or amendments are required as a result of the review, this will be performed in accord with the details outlined in Section 5.9.

Modification or qualification of data may be performed and documented during the review of staging files, which is performed as described in the Electronic Data Upload SOP No. WGI-VBI70-01.

5.8.3 Data Amendment/Correction

The Data Amendment/Correction form (Figure 5-1) provides the mechanism to request changes to a document or electronic data record and provides an audit trail for subsequent data processing. Only data that have been transferred to the DMT may be submitted for amendment/correction. Changes to data requested as a result of data screening are identified and justified on the Data Amendment/Correction form, along with supporting documentation as appropriate. The Data Amendment/Correction form is assigned a sequential log number and routed to the Field Activities Database Manager or Site Manager for approval prior to processing.

Correction to property addresses in the GIS property coverage is documented on a Map/Address Correction Form in the Map/Address Correction Log (Figure 5-2). If the existing address and parcel data presented on working maps does not reflect the current property boundaries and addresses, the field team documents the discrepancy on the form. The form is submitted to the GIS Specialist, who determines the appropriate resolution to correct the parcel coverage. The resolution is recorded on the Map/Address Correction Form and reviewed by the Project Database Manager and routed to the Field Activities Database Manager or Site Manager for approval prior to processing. If the discrepancy requires modification to the Project Database, the correction is processed as described above on the Data Amendment/ Correction form.

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Figure 5-1 – Data Amendment/Correction Form

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Figure 5-2 – VB/I-70 Map/Address Correction Log

ITEM No.:	WORK AREA:	ADDRESS ON MAP:	COC #: (If applicable)	DATASHEET PAGE:
	ADDRESS RECORDED IN FIELD DOCUMENTS:			
	DISCREPANCY:			INITIAL & DATE
	RESOLUTION:			INITIAL & DATE
ITEM No.:	WORK AREA:	ADDRESS ON MAP:	COC #: (If applicable)	DATASHEET PAGE:
	ADDRESS RECORDED IN FIELD DOCUMENTS:			
	DISCREPANCY:			INITIAL & DATE
	RESOLUTION:			INITIAL & DATE

5.9 Records Management

Data storage and security are critical aspects of data management. During the life of a project, all data developed as a consequence of field, laboratory, archival, and analytic investigations are under the direct control of the DMT. In the paragraphs that follow, descriptions are provided of the controls that the DMT uses for the storage, access, maintenance and security of project data.

5.9.1 Short-Term Records Management

Short-term records management is defined as the controlled storage of data in either hard copy or electronic formats during the active life of a project. Records management also includes the procedures and protocols that are used to control access and maintain physical security of project technical data. The following paragraphs describe the storage and security requirements for both hard copy and electronically formatted data files.

5.9.1.1 Hard Copy Data Files

Two separate categories of hard copy files are identified for the management of project documents: Master Files and Project Files.

Master Files - The master files are the repository for original and amended copies of all project primary data, which include field forms, notebooks, maps, and laboratory data packages. These files also include any secondary and interpretive data that are considered important to the project decision-making process. These master files are stored in secure locations. These files as well as other administrative records are eventually transferred to, or are currently under the formal custody of the USEPA Records Center.

Project Files - The project files are in-house duplicate copies of the master files. Master files include all documents related to the project. In addition, they may contain copies of secondary and interpretive data documents. The project files are stored in locked file cabinets. These files are stamped "copy".

5.9.1.2 Electronic Data Files

In addition to hard copy versions of project technical data, the DMT is responsible for the electronic storage and maintenance of field and laboratory data. Because of the importance of these files to the overall decision-making process, considerable care is exercised by the DMT in the creation, maintenance, and security of the project's computerized database. The paragraphs that follow describe the procedures and protocols for electronic data entry, verification, maintenance and access/security.

Data Entry - Data entry includes both manual transfer of information from hard copy records and automated transfer from electronic files. Typically, manual data entry is used for field data and electronic transfer is used for laboratory data. Most data parameters are identified during project planning and therefore are systematically entered into the project database.

Data Verification - Typically, data entry makes use of only screened, verified, and validated records and, once data are entered, they are verified against those records for accuracy and completeness. The method used to verify the electronic record varies according to the means by which data are entered. The details of data verification are summarized in Section 5.8.1).

Database Maintenance - To ensure the integrity of the project database, the Data Server Manager performs regular, periodic file maintenance activities. These include making daily backup copies of all database files to provide the means to restore them in the event of system failure or file corruption. A backup tape of the database files will also be stored off-site.

Database Modifications - Modifications to database structures are only performed at the direction or approval of the various investigators and data users. Changes to database structures are accommodated and documented by filing a Request for Data Services form with the DMT.

Database Access and Security - In order to minimize the potential for data corruption, password-protected access to the project database is controlled by the Data Server Manager. Only the Project Database Manager (or designee) has full access and is allowed to alter the structure of the database or its underlying programming. Project managers and technical personnel have read-only access to the database. They may perform on-line query or analyses of the data without restriction; however, they cannot alter the structure or content of the database. They may also request that the DMT provide hard copy summary reports or diskette copies of particular data sets. Files downloaded to project personnel are treated as derivative primary data and are not recorded in the Document Control Database. They also are not incorporated into the Master Document Files or the Project Files because they can be re-created from the project database.

5.9.2 Long Term Records Management

Data and records of data generated as a result of USEPA work assignments are the property of the USEPA. Long-term management of data files is outside of the responsibility of the DMT. Upon completion of the work assignment, Master Document Files as well as electronic copies of the Project Database and Document Control Database will be transferred to the custody of the USEPA Records Center.

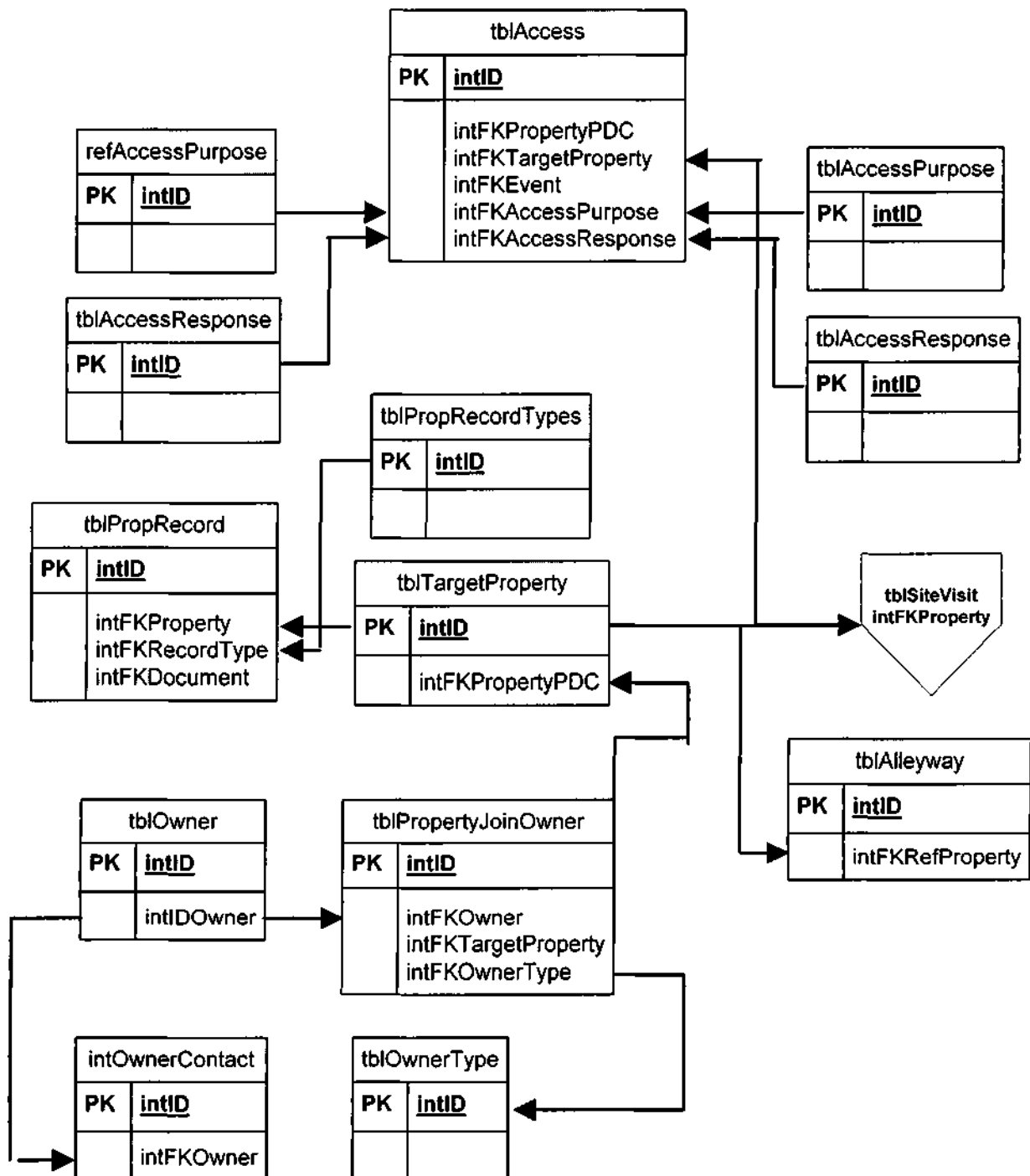
Appendix H:

Data Management Plan Additions

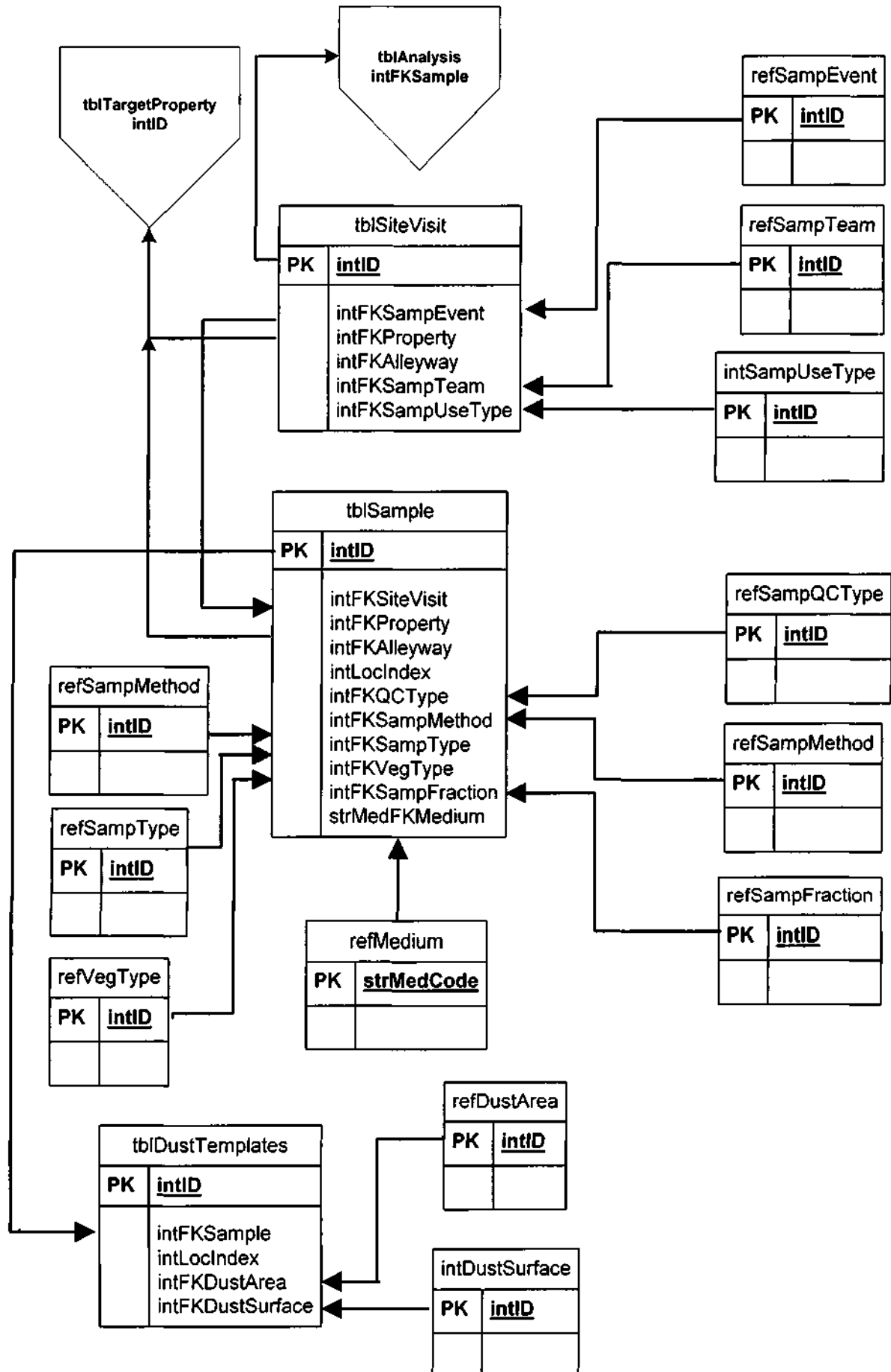
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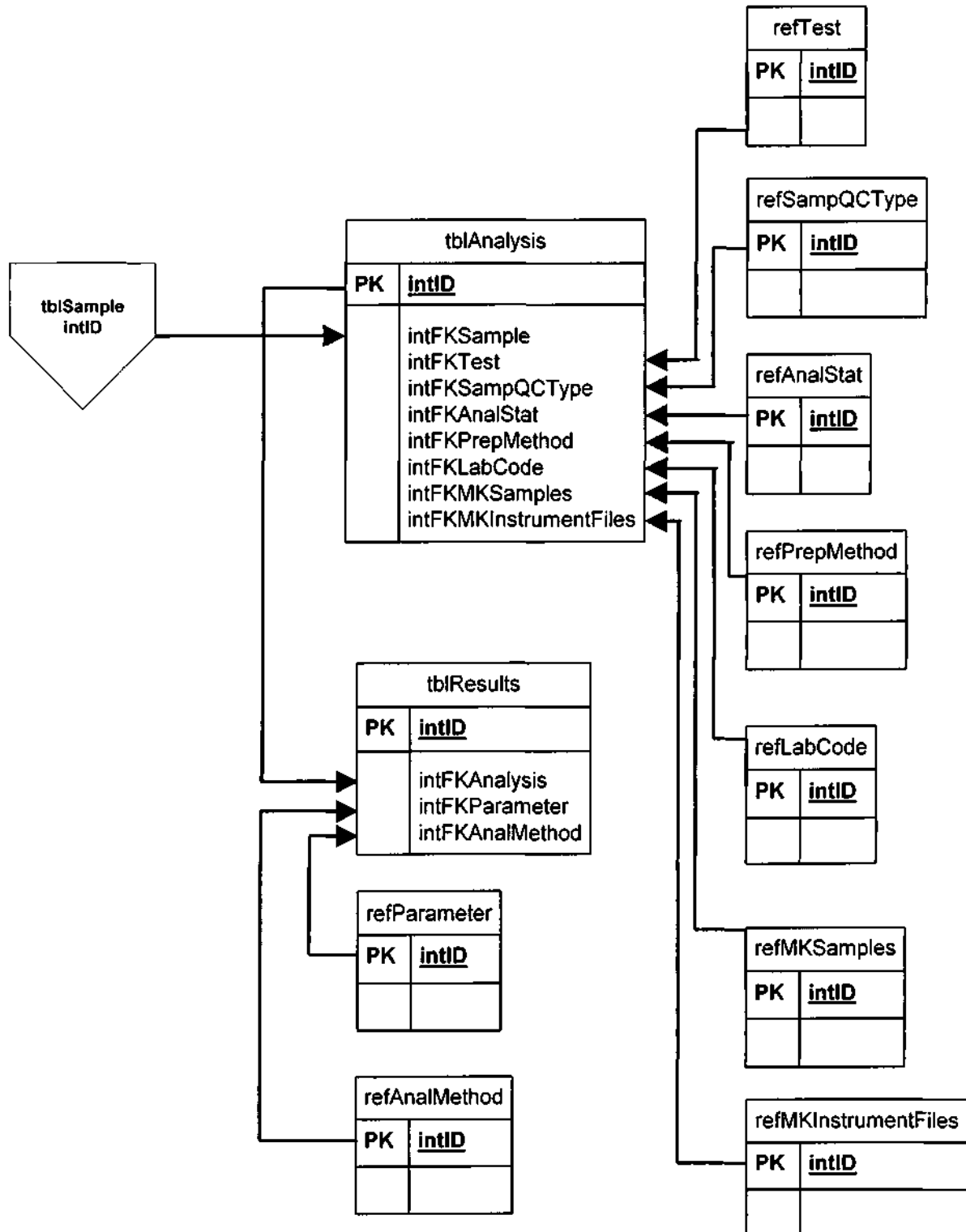
VB-I70 Entity Relationship Diagram



VB-I70 Entity Relationship Diagram



VB-I70 Entity Relationship Diagram



The **primary key** for a table uniquely identifies each row in the table. The primary key is generated by the database system.

The **Foreign key** is a value in a table row that points to a unique record in another table. The Foreign key is the basis for the relationships among one or more tables. In the database, a field containing a Foreign key contains the designator **FK** somewhere in the field name.

For **Text** fields, the length indicated in parentheses is the maximum length for the text value. The storage used in the database depends on the actual length of the input text, with the maximum length indicated. The amount of storage in the database is not increased by using maximum lengths in excess of the actual lengths of data in the fields. Each Text field is variable-length, and requires an extra two bytes so that the actual data length can be stored.

Primary Data Storage Tables

The following tables contain primary project information collected on the VB-I70 project.

Table Name	Description / Contents
tblAccess	Access Agreement letter tracking and recipient / responder data
tblAlleyway	Alleyway description for the property
tblAnalysis	Lab analysis tracking
tblCLIInstrumentFiles	Work table used for uploading CLI data
tblCLRResults	Work table used for recording CLI analytical results
tblCLSamples	Work table used for recording CLI samples data
tblDustTemplates	Cross-reference table used for correlating dust area and dust surface information
tblMKInstrumentFiles	Work table used for uploading Washington Group data
tblMKResults	Work table used for recording Washington Group analytical results
tblMKSamples	Work table used for recording Washington Group samples data
tblOwner	Property owner information
tblOwnerContact	Property owner contact information
tblPropertyJoinOwner	Cross-reference table between property and current owner(s)
tblPropRecord	Cross-reference table between property and date(s) of ownership record
tblResults	Analytical results
tblSample	Physical sample description
tblSiteVisit	Site visit records
tblStdLog	SSI log processing information
tblTargetProperty	Legal and physical information about each property
dbo_tblDocuments	Access agreement documents by property

Reference Data Storage Tables

The following tables contain lookup and validation information, and are usually referenced by one or more of the primary information storage tables, or by the software applications.

Table Name	Description / Contents
refAccessPurpose	Reason for accessing property
refAccessResponse	Response to property access request
refAnalMethod	Analysis method
refAnalStat	Analysis status
refDustArea	Areas in residence where dust collected
refDustSurface	Surfaces where dust collected
refLabCode	Laboratory codes

refLoadStatus	Database file load status codes and descriptions
refMedium	Sampling media
refOwnerType	Property ownership codes and types
refParameter	Analytical parameters
refPrepMethod	Analytical sample preparation methods
refPropRecordTypes	Property record types
refPropSoilType	Property soil types
refSampEvent	Project phases incorporating sampling event descriptions
refSampFraction	Sampling fractions
refSampleMethod	ISSI Sampling methods
refSampleQCType	Quality control method used on samples
refSampTeam	Sampling team used to collect sample
refSampType	Sample types
refSampUseType	Property use descriptions
refTest	Analytical test types
refVegType	Vegetable codes and types

Table tblAccess : Access Agreement Letter Tracking

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
intFKPropertyPDC	Unused column	Long Integer	
intFKTargetProperty	Foreign key to column intID	Long Integer	Table tblTargetProperty
intFKEvent	Unused column	Long Integer	
intFKAccessPurpose	Foreign key to column intID	Long Integer	Table refAccessPurpose
strDCN	Document control number	Text (255)	
strPropAddress	Property address	Text (255)	
strOwnerOccupied	"Y" if occupied by owner	Text (1)	"Y", "N"
strOwnName1	Name of primary owner	Text (255)	
strOwnName2	Name of secondary owner	Text (255)	
strOwnName	Name of reported owner	Text (255)	
strOwnAddress	Street address of reported owner	Text (255)	
strOwnCity	City of reported owner	Text (255)	
strOwnState	State of reported owner	Text (2)	
strOwnZIP5	5-digit ZIP Code of reported owner	Text (5)	
strOwnPhone1	Primary phone of reported owner	Text (25)	
strOwnPhone2	Secondary phone of reported owner	Text (25)	
strCoOwnName	Name of co-owner	Text (255)	
strCoOwnAddress	Street address of Co-owner	Text (255)	
strCoOwnCity	City of co-owner	Text (255)	
strCoOwnState	State of co-owner	Text (255)	
strCoOwnZIP5	5-digit ZIP Code of co-owner	Text (5)	
dteRequest	Date of request	Date / Time	
dteResponse	Date of response	Date / Time	Cannot precede Date of Request
intFKAccessResponse	Foreign key to column intID	Long Integer	Table tblAccessResponse
strReturnUndeliv	"Y" if returned as "undeliverable"	Text (1)	"Y", "N"
strGrantedBy	Name of individual granting access to property	Text (255)	
strRespRelation	Relationship between owner and individual responding	Text (25)	
strRespName	Name of individual responding	Text (255)	
strRespAddress	Address of individual responding	Text (255)	
strRespCity	City of individual responding	Text (255)	
strRespState	State of individual responding	Text (2)	
strRespZIP5	5-digit ZIP Code of individual responding	Text (5)	
dteGranted	Date access granted	Date/Time	
dteDeclined	Date access declined	Date/Time	
strOwnLanguage	Language of primary owner	Text (40)	
strRespLanguage	Language of individual responding	Text (40)	
strNotIfRequired	"Y" if ????	Text (1)	"Y", "N"
strRenterPhone	Phone number of renter, if any	Text (25)	
strSplitSample	"Y" if split sample	Text (1)	"Y", "N"
strComments	Comments on this access attempt	Text (255)	
dteLoaded	Date access-attempt record loaded to database	Date / Time	

Table tblAlleyway : Property Alleyway Descriptions

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strAlleywayID	Alleyway identification	Text (255)	
intFKRefProperty	Foreign key to column intFKPropertyPDC	Long Integer	Table tblTargetProperty
strBoundingStreet1	Name of first street boundary	Text (255)	
strBoundingStreet2	Name of second street boundary	Text (255)	
strBoundingStreet3	Name of third street boundary	Text (255)	
strBoundingStreet4	Name of fourth street boundary	Text (255)	
strDescription	General description	Text (255)	
dblEdgeStreet1	Footage on first street	Double	
dblEdgeStreet2	Footage on second street	Double	
dblInterval	Difference	Double	

Table **tblAnalysis** : Analytical Results

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
intFKSample	Foreign key to column intID	Long Integer	Table tblSample
intFKTest	Foreign key to column intID	Long Integer	Table tblTest
intFKSampQCType	Foreign key to column intID	Long Integer	Table refSampQCType
intFKAnalStat	Foreign key to column intID	Long Integer	Table refAnalStat
intFKPrepMethod	Foreign key to column intID	Long Integer	Table refPrepMethod
dteAnalDateTime	Date and time of analysis	Date / Time	
dtePrepDateTime	Date and time of sample preparation	Date / Time	
intFKLabCode	Foreign key to column intID	Long Integer	Table refLabCode
strLabID	Name of laboratory	Text (255)	
strInstID	Instrument ID	Text (255)	
strFieldSample	Field sample identifier	Text (255)	
strLabSample	Lab individual sample identifier	Text (255)	
strLabParentSample	Lab parent sample identifier	Text (255)	
strAnalBatchNo	Analysis batch number	Text (255)	
strPrepBatchNumber	Preparation batch number	Text (255)	
strBatchNo	Batch number	Text (255)	
strTagNo	Tag number	Text (255)	
strCocNo		Text (255)	
blnReject	True if rejected	Yes / No	
intFKMKSamples	Foreign key to column intID	Long Integer	Table tblMKSamples
intFKMKInstrumentFiles	Foreign key to column intID	Long Integer	Table tblMKInstrumentFiles
dtePostDate	Date analysis posted to database	Date / Time	

Table **tblCLIInstrumentFiles** : Work Table Used for Uploading CLI Files

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strFileName	Results file name	Text (255)	

dteCreated	Date file created	Date / Time	
dteReceived	Date file received for processing	Date / Time	
strComments	Comments on file, etc.	Text (255)	
intFKLoadStatus	Foreign key to column intID	Long Integer	Table refLoadStatus
binContents	OLE link to file	OLE Object	

Table **tblCLResults** : Work Table Used for Recording CLI Analytical Results

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
intFKCLSample	Foreign key to column intID	Long Integer	Table tblCLSamples
strParameter	Analytical parameter	Text (255)	
strResult	Analytical result (text)	Text (255)	
dblResult	Analytical result (numeric)	Double	
strCFlag	Not used	Text (255)	
strVFlag	"Y" if validated.	Text (1)	"Y", "N"
dblTolerance	Numeric tolerance on results	Double	
dteLoaded	Date / time loaded to database	Date / Time	

Table **tblCLSamples** : Work Table for CLI Samples Taken

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
intFKMKInstrumentFiles	Foreign key to column intID	Long Integer	Table tblCLIInstrumentFiles
strFileName	File name containing samples	Text (255)	
dteDate	Date sample(s) taken	Date / Time	
strTime	Time sample(s) taken (text)	Text (25)	
strSampleInst	Instrument ID used in sampling	Text (255)	
strSampleLoad	Sample loading protocol	Text (255)	
strParent	Parent sample ID	Text (255)	
strClass	Sample classification	Text (255)	
binReject	True if sample rejected	Yes / No	True, False
intSeqDaily	Sequence number of sample on date taken	Long Integer	
intSeqHist	Sequence number of sample in sampling history	Long Integer	
strAddress	Sample site address	Text (255)	
strCommentsr	Comments on sample	Text (255)	
intFKSample	Foreign key to column intID	Long Integer	Table tblSample
intLoadFile	Sequence number of file load	Long Integer	
dteLoaded	Date / time loaded into database	Date / Time	
dtePosted	Date / time information posted to Washington Group	Date / Time	
strErrorCode	Error code	Text (2)	
strErrorComment	Error comments	Text (255)	

Table **tblDustTemplates** : Cross-Reference Table for Correlating Dust Area and Dust Surface Information

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
intFKSample	Foreign key to column intID	Long Integer	Table tblSample
intLocIndex	Not used	Long Integer	
intFKDustArea	Foreign key to column intID	Long Integer	Table refDustArea
intFKDustSurface	Foreign key to column intID	Long Integer	Table refDustSurface
strNotes	Comments	Text (255)	

Table **tblMKInstrumentFiles** : Washington Group Lab Analytical Results Files

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strFileName	Results file name	Text (255)	
dteCreated	Date file created	Date / Time	
dteReceived	Date file received for processing	Date / Time	
strComments	Comments on file, etc.	Text (255)	
intFKLoadStatus	Foreign key to column intID	Long Integer	Table refLoadStatus
binContents	OLE link to file	OLE Object	
dtePostDate	Date analysis posted to database	Date / Time	

Table **tblMKResults** : Lab Analytical Results

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
intFKMKSample	Foreign key to column intID	Long Integer	Table tblMKSamples
strParameter	Analyte	Text (25)	
strResult	Analytical result in text form	Text (25)	
dblResult	Analytical result in numeric form	Double	
strCFlag	Not used	Text (255)	
strVFlag	Not used	Text (255)	
strUnits	Units of measure	Text (10)	
dblTolerance	Sample tolerance	Double	
dteLoaded	Date loaded into database	Date / Time	

Table **tblMKSamples** : Samples Taken

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
intFKMKInstrumentFiles	Foreign key to column intID	Long Integer	Table tblMKInstrumentFiles
strFileName	File name containing samples	Text (255)	
dteDate	Date samples taken	Date / Time	
dteTime	Time samples taken	Date / Time	
strSampleInst	Sampling instrument ID	Text (255)	
strSampleLoad	Sampling instrument ID loaded to database ??	Text (255)	
strParent	Parent sample ID if split	Text (255)	

strClass	Sampling class identifier	Text (25)	
blnReject	"True" if sample rejected	Yes / No	
intSeqDaily	Daily sequence number	Long Integer	
intSeqHist	Historical sequence number	Long Integer	
strAddress	Street address where taken	Text (255)	
strComments	Comments	Text (255)	
intFKSample	Foreign key to column intID	Long Integer	Table tblMKSamples
intLoadFile	Load file sequence number	Long Integer	
dteLoaded	Date loaded into database	Date / Time	
dtePosted	Date posted to database	Date / Time	
strErrorCode	Error code if sample in error	Text (255)	
strErrorComment	Error explanation	Text (255)	

Table tblOwner : Property Owners

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
intIDOwner	Numeric owner identification	Long Integer	
strOwnName1	Name of primary owner	Text (255)	
strOwnName2	Name of secondary owner	Text (255)	
strOwnAddress	Street address of primary owner	Text (255)	
strOwnCity	City of primary owner	Text (50)	
strOwnState	State of primary owner	Text (2)	
strOwnZIP5	5-digit ZIP Code of primary owner	Text (5)	
strOwnPhone	Phone of primary owner	Text (25)	
strOwnPhone2	Alternate phone of primary owner	Text (25)	
strOwnLanguage	Language of primary owner	Text (25)	
dteConfirmed	Date above information confirmed	Date / Time	
strComments	Comments	Text (255)	

Table tblOwnerContact : History of Contacts with Property Owners

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
intFKOwner	Foreign key to column intID	Long Integer	Table tblOwner
dteContactDate	Date of contact	Date / Time	
strContactBy	Name / initials of individual making contact	Text (50)	
strComments	Comments	Text (255)	

Table tblPropertyJoinOwner : Links Property Owners with Properties

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
intFKOwner	Foreign key to column intID	Long Integer	Table tblOwner
intFKTargetProperty	Foreign key to column intID	Long Integer	Table tblTargetProperty
intFKOwnerType	Foreign key to column intID	Long Integer	Table tblOwnerType
dteVerified	Date above information confirmed	Date / Time	

strComments	Comments	Text (255)	
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Table **tblPropRecord** : Cross-Reference Table Between Property and Date(s) of Ownership Record

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
intFKProperty	Foreign key to column intID	Long Integer	Table tblProperty
dteRecordDate	Date of property record	Date / Time	
intFKRecordType	Foreign key to column intID	Long Integer	Table refPropRecordTypes
intFKDocument	Foreign key to column intID	Long Integer	Table dbo_tblDocuments

Table **tblResults** : Analytical Results

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
intFKAnalysis	Foreign key to column intID	Long Integer	Table tblAnalysis
intFKParameter	Foreign key to column intID	Long Integer	Table refParameter
intFKAnalMethod	Foreign key to column intID	Long Integer	Table refAnalMethod
dblResult	Result value (numeric)	Double	
strResult	Result value (text)	Text (255)	
strCFlag	Not used	Text (255)	
strQFlag	Not used	Text (255)	
strVFlag	Not used	Text (255)	
dblDL	Detection limit (numeric)	Double	
strDL	Detection limit (text)	Text (255)	
strUnits	Units of measure	Text (255)	
dblDilutionFactor	Dilution factor	Double	
strBasis	"Wet" vs. "Dry" (where applicable)	Text (1)	
dblSpikeConc	Spike concentration	Double	
dblRPD		Double	
dblResultQual	Qualified result value	Double	
strFlagQual	"U" if below detection limit, "R" if result rejected	Text (2)	
strComments	Comments	Text (255)	
strQualComment	Qualified result comments	Text (255)	
dteLastUpdate	Date analysis last updated	Date / Time	

Table **tblSample**: Physical Sample Description

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
intFKSiteVisit	Foreign key to column intID	Long Integer	Table tblSiteVisit
intFKProperty	Foreign key to column intID	Long Integer	Table tblProperty
intFKAlleyway	Foreign key to column intID	Long Integer	Table tblAlleyway
intLocIndex	Not used	Long Integer	
strFKMedium	Foreign key to column strMedCode	Text (5)	Table refMedium
strSampNo	Sample Number	Text (255)	
dteSampDateTime	Sample date / time	Date / Time	
intFKSampQCType	Foreign key to column intID	Long Integer	Table refSampQCType

intFKSampMethod	Foreign key to column intID	Long Integer	Table refSampMethod
intFKSampType	Foreign key to column intID	Long Integer	Table refSampType
intFKVegType	Foreign key to column intID	Long Integer	Table refVegType
intFKSampFraction	Foreign key to column intID	Long Integer	Table refSampFraction
strParentSample	Parent sample ID	Text (255)	
strCoLocateSample	Co-located sample ID	Text (255)	
strCOCNo	Chain-of-custody ID	Text (255)	
strLogBookNo	Sample log book ID	Text (255)	
intLogBookPage	Sample log book page number	Long Integer	
strSampComment	Comments on sample	Text (255)	
dblDepthTop	Depth to top of sample	Double	Inches
dblDepthBottom	Depth to bottom of sample	Double	Inches
dblNorthing	Sample northing	Double	
dblEasting	Sample northing	Double	
dtePostDate	Date and time sample posted to database	Date / Time	

Table tblSiteVisit : Table of Site Visit Information

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
dteVisitDate	Date / time of sampling site visit	Date / Time	
intFKSampEvent	Foreign key to column intID	Long Integer	Table refSampEvent
intFKProperty	Foreign key to column intID	Long Integer	Table tblTargetProperty
intFKAlleyway	Foreign key to column intID	Long Integer	Table tblAlleyway
intFKSampTeam	Foreign key to column intID		Table refSampTeam
intFKSampUseType	Foreign key to column intID		Table refSampUseType
intVisitComment	Comments on visit	Text (255)	This field has an incorrect prefix (int) which should be str
strGardenPresent	"Y" if garden on property	Text (1)	"Y", "N"
strConfirmedAddress	"Y" if address confirmed	Text (1)	"Y", "N"
strAllowFurtherSampling	"Y" if further sampling is permitted by owner	Text (1)	"Y", "N"

Table tblStdLog : Table of SSI Log Processing Information

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strWorkOrderNo	Work Order number	Text (255)	
strStandardCode	Standards code	Text (255)	???
strStandardNo	Standards number	Text (255)	???
strArbitraryAddress	Identifying address of sample	Text (255)	
dteSubmittedMK	Date / time sample submitted to Washington Group for review	Date / Time	
strContractor	Contractor name	Text (255)	

dteBlindSampPrep	Date / time "blind" sample prepared	Date / Time	
strAnalysis	Analysis used	Text (255)	
strStatus	Sample status	Text (255)	
strCombinedWith	Sample ID with which this sample is combined	Text (255)	
strSSIComment	SSI comments	Text (255)	
strMKComment	Washington Group comments	Text (255)	

Table tblTargetProperty: Target Property Descriptions

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
intFKPropertyPDC	Foreign key to column intFKRefProperty	Long Integer	Table tblPropertyJoinOwner
strPropertyType	Property type	Text (255)	
strDescription	Property description	Text (255)	
strPropHouseNum	Property street number	Text (20)	
strPropStDir	Street direction	Text (2)	"N", "NW", etc.
strPropStName	Street name	Text (50)	
strPropStType	Street type	Text (10)	"Street", "Lane", etc.
strPropAddress	Complete street address	Text (100)	
strPropCity	City	Text (50)	
strPropState	State abbreviation	Text (2)	
strPropZIP5	5-digit ZIP Code	Text (5)	
strNeighborhood_PDC	Neighborhood group	Text (255)	
strNeighborhood	Neighborhood name / description	Text (255)	
strRenterLanguage	Primary language of renter	Text (40)	
strRenterPhone	Telephone number of renter	Text (25)	
strGardenPresent	"Y" if garden on property	Text (1)	"Y", "N"
strConfirmedAddress	"Y" if address confirmed	Text (1)	"Y", "N"
strAllowFurtherSampling	"Y" if further sampling will be allowed	Text (1)	"Y", "N"

Table dbo_tblDocuments : Table of Access Agreement Documents by Property

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
binImage	Access agreement document image	OLE Object	
strImageComments	Comments	Text (255)	
intFKTargetProperty	Foreign key to column intID	Long Integer	Table tblTargetProperty
intFKAccess	Foreign key to column intID	Long Integer	Table tblAccess
strDocType	Document type	Text (50)	

Table refAccessPurpose : Reference Table of Reasons for Property Access

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strPurpose	Reason for access	Text (100)	

Table refAccessResponse : Reference Table of Responses to Property Access

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strResponseCode	Response code	Text (15)	
strResponse	Response	Text (255)	

Table refAnalMethod : Reference Table of Analysis Methods

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strAnalMethodCode	Analysis method code	Text (15)	
strAnalMethod	Analysis method	Text (255)	

Table refAnalStat : Reference Table of Analysis Status

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strAnalStatCode	Analysis status code	Text (1)	"P", "F"
strAnalStat	Analysis status	Text (255)	"Preliminary", "Final"

Table refDustArea : Reference Table of Areas in Residences Where Dust Collected

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strDustAreaCode	Dust area code	Text (2)	
strDustArea	Dust area	Text (255)	

Table refDustSurface : Reference Table of Surfaces Where Dust Collected

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strDustSurfaceCode	Dust surface code	Text (2)	"H", "S"
strDustSurfaceDescription	Dust surface	Text (255)	

Table refLabCode : Reference Table of Laboratory Codes and Descriptions

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strLabCode	Lab code	Text (10)	
strLabDescription	Lab description	Text (255)	

Table refLoadStatus : Reference Table of Database File Load Status Codes and Descriptions

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	

strLoadStatusCode	Load status code	Text (2)	
strLoadStatusDescription	Load status description	Text (255)	

Table refMedium : Reference Table of Sampling Media

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strMedCode	Sampling media code	Text (2)	
strMedDescription	Sampling media description	Text (255)	

Table refOwnerType : Reference Table of Owner Types

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strOwnerTypeCode	Owner type code	Text (3)	"PRI", "CO"
strOwnerTypeDescription	Owner type description	Text (255)	"Primary Owner", "Co-Owner"

Table refParameter : Reference Table of Analytical Parameters

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strParamCode	Parameter code	Text (6)	
strParamTypeDescription	Parameter name / description	Text (255)	

Table refPrepMethod : Reference Table of Sample Preparation Methods

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strPrepMethodCode	Sample preparation code	Text (10)	
strPrepMethodDescription	Sample preparation method	Text (255)	

Table refPropRecordTypes : Reference Table of Property Record Types

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strRecordTypeCode	Record type code	Text (10)	
strRecordTypeDescription	Record type	Text (255)	

Table refPropSoilType : Reference Table of Property Soil Types

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strPropSoilTypeCode	Soil type code	Text (10)	
strPropSoilTypeDescription	Soil type description	Text (255)	

Table refSampEvent : Reference Table of Project Phase / Sampling Event Descriptions

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strEventCode	Event code	Text (2)	

strEventDescription	Project phase	Text (255)	
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Table refSampFraction : Reference Table of Sampling Fraction Descriptions

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strFractionCode	Fraction code	Text (1)	
strFractionDescription	Sampling fraction	Text (255)	

Table refSampMethod : Reference Table of ISSI Sampling Method Descriptions

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strMethodCode	Method code	Text (20)	
strMethodDescription	Sampling method	Text (255)	

Table refSampQCType : Reference Table of Quality Control Methods Used on Sample

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strSampQCCode	QC method code	Text (3)	
strSampQCDescription	QC method description	Text (255)	
strSampQCClass	QC class code	Text (2)	"LQ", "FQ", "NF"
boolParentReq	"True" if parent sample required	Yes / No	True, False

Table refSampTeam : Reference Table of Sampling Team Descriptions

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strTeamCode	Team code	Text (10)	"COMP", "GRAB"
strTeamDescription	Description of sampling team	Text (255)	

Table refSampType : Reference Table of Property Type Descriptions

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strTypeCode	Sample type code	Text (2)	
strTypeDescription	Description of sample type	Text (255)	

Table refSampUseType : Reference Table of Sample Use Descriptions

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strUseTypeCode	Sample use code	Text (2)	
strUseTypeDescription	Description of sample use	Text (255)	

Table refTest : Reference Table of Analytical Test Descriptions

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	

strTestCode	Test code	Text (10)	
strTestDescription	Test description	Text (255)	

Table refVegType : Reference Table of Vegetable Type Descriptions

Field Name	Field Description	Format	Valid Values / Notes
intID	Unique record identifier	AutoNumber	
strVegTypeCode	Vegetable type code	Text (2)	
strVegTypeDescription	Vegetable type description	Text (255)	